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Independent Evaluation ADB

Evaluation Approach

Project Performance Evaluation Report on Loan 1452-NEP(SF): Kali Gandaki "A" Hydroelectric Project in Nepal

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A. Reason for Selecting Kali Gandaki "A" Hydropower Project for Evaluation

1. The Independent Evaluation Department (IED) of the Asian Development Bank (ADB) included the Kali Gandaki "A" Hydropower Project[1] in Nepal in its annual work program for 2011 evaluation because:

(i) IED wishes to undertake a special evaluation study (SES) on safeguards implementation (inclusive of country systems) in 2014.

(ii) ADB will be looking to invest in energy projects in Asia and Pacific during the next decade and specifically in hydropower as "sustainable and renewable energy." The ADB Community of Practice energy database reveals ADB was involved in hydropower projects with a combined cost of $4.5 billion since 1995. ADB's own pipeline hydropower projects to 2014 amount to $243 million. IED can thus play a forward looking role for the benefit of operations teams by undertaking evaluations of performances of past hydropower projects including (but not limited to) complex issues related to environment and social impacts.

(iii) Installed capacity in hydropower in Asia is forecasted to increase from 315 GW (2011) to 485 GW (2021) which is equivalent to 70 hydropower stations like NT2 in the next 10 years.[2] To date, environmental and social aspects (safeguards implementation) remain extremely weak and this is likely to continue to promote unsustainable development in the regions involved. The present project performance evaluation report (PPER) and subsequent ones to be produced in IED in 2012 will aim to combine into a knowledge product to be disseminated to hydro project developers with the aim to assist in designing and implementing meaningful and cost effective environmental and social protection measures.[3]

(iv) Whilst Kali Gandaki "A" has been in operation since 2002 and thus is 11 years old, environmental issues such as sedimentation of the desanders are only now being felt. In addition, social impacts of resettled families in terms of livelihoods take many years to surface. Financial sustainability of the NEA is also a concern that needs many years of operations to come to the surface. For these reasons, it was felt Kali Gandaki "A" was suitable project to evaluate.

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[1] ADB. 1996. *Report and Recommendation of the President on a Proposed Loan and Technical Assistance Grants to Nepal for the Kali Gandaki "A" Hydroelectric Project*. Manila. (Loan 1452-NEP[SF], $160.0 million, approved on 23 July).

[2] US Energy Information Administration. http://www.eia.gov/

[3] September 2011 discussion with ADB Energy CoP support the idea of a knowledge product for hydro power industry as well as ADB teams.

(v) The Tanahu Hydropower Project in Nepal scheduled for Board approval in October 2012 with a pipeline value of $75 million will benefit directly throughout its design process from the present PPER.

B. Background

2. According to Nepal Electricity Authority (NEA) Hydropower Act 1992, Nepal's power sector had an installed capacity of around 278 megawatts (MW) in 1991, which included 233 MW of hydropower and 45 MW of diesel power. It supplied electricity to around 200,000 consumers or approximately 6% of the population. By the government's estimates then, 300–400 MW must be added to the national electricity system by the end of the century to meet the projected demand for electric power. The country's vast hydropower potential estimated at around 83,000 MW brought to fore the possible projects like Arun III[4] and Kali Gandaki both identified to fill in the supply gap. The Kali Gandaki "A" project was identified primarily as an interim project for commissioning in 1998, to meet load demand until the commissioning of the Arun Project expected in fiscal year 2002.

3. In 1991, the United Nations Development Programme (UNDP) provided $1.17 million for the feasibility study for the Kali Gandaki "A" Hydroelectric Project. The feasibility study which was executed by the United Nations Department of Technical Cooperation for Development (UNDTC) and subcontracted to a Canadian consulting firm was completed in January 1992 and established an economic internal rate of return (EIRR) of 13.1%. UNDP provided supplementary financing of $680,000 for further site investigations in January 2002 for completion in August 2002.

4. To complete the preparation for the Kali Gandaki Project, the government requested the Asian Development Bank (ADB) to use the projected savings from the Fifth Power Project[5] through a change in project scope to cofinance (with UNDP and the Finnish Development Cooperation Agency) the cost of consulting services, model testing and other supporting investigations necessary to carry out detailed engineering and preparation of tender documents for the Kali Gandaki ”A” Hydroelectric Project and for the remuneration of a panel of experts. The government also requested ADB to take the lead role in executing the Kali Gandaki "A" Project.

5. In February 1996, a fact-finding mission was fielded, and in March 1996, an appraisal of the Project was undertaken. An ADB loan[6] for $160 million to cofinance one half of the foreign exchange requirements of the Kali Gandaki "A" Project was approved on 23 July 1996. The Japan Bank for International Cooperation (JBIC) financed the remaining half of the foreign exchange requirements. The Government was to finance all the local currency requirements of the Project. The final report for the detailed project design was received in January 1997.

C. Project Objective and Scope at Appraisal

6. The stated objective of the Kali Gandaki "A" according to ADB proposal was help meet the increasing demand for electricity in Nepal in an environmentally sustainable, socially acceptable, and least-cost manner. According to NEA Hydropower Policy of 1992, the

[4] The proposed Arun III Hydro Project was to be located on the Arun River in Sankhuwasabha district and was expected to have a total generation capacity of 404 MW.
[5] ADB. 1983. *Fifth Power Project*. Manila. (Loan 670-NEP[SF], approved for $20.0 million, on 14 December).
[6] ADB. 1996. *Kali Gandaki "A" Hydroelectric Project*. Manila. (Loan 1452-NEP[SF], approved for $160.0 million, on 23 July).

objectives of the project were to supply electricity according to the demand in urban and rural areas, to enhance hydropower for industry needs, to motivate private/public sector investment in hydropower, and to supply clean energy and conserve environment. The project as envisaged had the following key components: (i) a 44-meter (m) high concrete gravity diversion dam and gated spillway, and an adjacent intake and de-sanding basin; (ii) a 5.9-kilometer (km) long concrete-lined headrace tunnel with a diameter of 7.4 m; (iii) a surge shaft, pressure shaft, tunnel leading to the power station and the power station; (iv) hydraulic steelworks including the supply of gates for the spillway, de-sander, headrace tunnel and power station, as well as the steel liners for the pressure tunnel; (v) electrical and mechanical plant and auxiliaries for the three 48-MW turbo-generating units, transformers, and switchgear to be installed at the power station; and (vi) two 132-kilovolt (kV) transmission lines, one to Pokhara (61.4 km) and the other to Butwal (44.3 km).

7. The borrower was the Government of Nepal and NEA was the executing agency. Improvement of NEA's cost recovery through tariff adjustments and improvements in operational efficiency partly through a reduction in system losses were included in the loan covenants.

8. The Project had two associated technical assistance (TA) grants. The first[7] TA was to build the capacity of the NEA for ensuring that environmental and social issues are adequately addressed in the design, construction, operation, and monitoring of power development projects in Nepal. The TA was to provide training to the NEA Environment Division staff and establish an environmental management information system.

9. The second[8] TA was to assist in the preparation of a new power system master plan for Nepal. On-the-job training was to be provided to the engineering staff of NEA in power system planning.

D. Environmental and Social Issues[9]

10. During the Environmental Impact Assessment (EIA), it was determined that the largest impact of the project was going to be on the aquatic ecology because of the reduction in water flow in the initial 13 km stretch below the dam. The adverse impact was expected to be greatest during the dry season in the reach just below the dam. Several options for mitigating impacts were explored and the trap and haul method was selected as the most appropriate mitigation measure.

11. Another environmental issue that was raised was the handling of spoil disposal. Estimates at appraisal indicated that even if all the spoil were to be released into the river at one time, it would only be the equivalent of approximately 10% of the sediment and bed load carried by the river during the height of the rainy season. It was also decided that one-third of the first year's spoil was to be placed at sites away from the river that are of marginal use and whenever possible spoil material suitable for farming were to be terraced for cultivation. Continuous monitoring of the spoil disposal was recommended.

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[7] ADB. 1996. *Institutional Strengthening of NEA's Environment Division*. Manila. (TA 2613-NEP, approved for $534,000, on 23 July).

[8] ADB. 1996. *Power System Master Plan*. Manila. (TA 2614-NEP, approved for $600,000, on 23 July).

[9] ADB. 1999. *Special Evaluation Study: Social and Environmental Impacts of Selected Hydropower Projects.* Manila. This special evaluation study (SES) notes that while at that time projects lacked funding for investigating environment and social impacts, Kali Gandaki "A" was exceptional in terms of resources provided for the environmental and social impact assessment (ESIA). The SES advises that while exact figure is not known, it is estimated to have been about $500,000.

12. A social impact study conducted at appraisal found that there was going to be a minimal amount of resettlement. Seventy five families were required to be resettled to give way to the construction of access roads in addition to eight landless families that were also resettled. Project affected families were reported to have been satisfied with the compensation that they received. Plans to provide access to jobs that may be created by the Project and support for the establishment of a new family enterprise were underway during appraisal.

13. Included in the discussion on social impacts was the issue of affordability of the electricity tariffs. The appraisal mission was tasked with determining the ability and willingness to pay by the major consumer groups and to determine how pricing policies would affect the distribution of and access to project benefits from poor clients.

E. Economic Evaluation and Analysis (At Appraisal)

14. The RRP analysis focused on the dependable pondage storage capacity of the scheme and the match of its energy capacity factor to that of NEA system. The NEA would develop a model of the least cost dependable capacity of the Project for each month and determine the resulting cost of system development. There were no mention of the integration of environmental and social costs into overall project costs. Initial assumptions for economic analysis were questioned by “EDRC” at the time.

F. Major Findings of the Project Completion Report

15. The Kali Gandaki "A" Project became effective on 12 December 1996 and closed on 31 December 2003, two and a half years beyond the scheduled closing date of 15 July 2001 indicated in the loan agreement, and after two extensions. The project completion report (PCR) was circulated to the Board in April 2004. The PCR rated the Project *highly relevant, highly efficacious (highly effective), efficient* and *likely sustainable* based on a reestimated financial internal rate of return (FIRR) of 12.6% and despite NEA's financial position which the PCR described as "problematic."

16. The PCR found that three major environmental concerns were not addressed satisfactorily. These were (i) the disposal of surplus construction materials and solid wastes; (ii) trapping and hauling of fish across the dam; and (iii) sustainable operation of the fish hatchery. There were a total of 17 families affected by the Project. The Project was also reported to have had both beneficial and adverse impact on the traditional livelihoods and lifestyles of the Bote community who depend on traditional fishing, ferrying people across the river in small boats, and working as wage laborers for their livelihood.

17. Two changes in scope were approved. The first was to increase the consulting services of the Project to address geological conditions that could not have been foreseen at design stage. The second change in scope was to reroute and extend the transmission line to Pokhara to avoid houses being located under the line. These changes partly contributed to implementation delays. Late mobilization of civil works contractor also partly contributed to the delays.

18. Actual project cost was $354.8 million or 78.3% of estimated cost. All components were reportedly installed and commissioned as envisaged at appraisal.

19. The PCR recommended (i) continued monitoring to determine if maintenance is being undertaken correctly; (ii) monitoring of compliance to financial covenants that remained outstanding at the time of PCR; (iii) that a post evaluation be carried out in 2005 or 2006.

20. The TA grants that came with the loan were both assessed *partly successful*.

G. NEA Environmental and Social Audit Findings

21. The ESSD is one of the departments of NEA and is responsible for post construction environmental impact audits of NEA. ESSD 2004 report stated that the objectives of the audit[10] was "to collect post-construction environmental and social data of the project area, find out the accuracy of impact predictions, assess the actual environmental impacts [that] occurred during implementation of the project, identify the remedial issues and suggest corrective measures." The mission intends to review the reports including post 2004 and use the findings for the PPER.

H. Key Issues of Concern for Independent Evaluation Mission (IEM)

22. The project performance audit report (PPER) will assess the Kali Gandaki "A" Project against the standard evaluation criteria of relevance, efficiency, effectiveness, and following the *Guidelines for Preparing Performance Evaluation Reports for Public Sector Operations*.[11] The evaluation will provide key insight into the IED Knowledge Program: SES Safeguards Implementation (Inclusive of Country Systems) [2014 Division Work Plan]. Climate change impacts and other environmental conditions such as siltation on the economic viability of the project will be investigated as well as the appropriateness of the scale of the project providing insight into the small versus large hydro debate and the inclusion of large hydro in the sustainable energy category. Because of this, the PPER proposes to go more in depth into the environmental and social aspects of the project. Lessons from other hydropower projects evaluations on these issues including Nam Leuk, Theun Hinboun and SES on Environmental and Social Impacts of Hydropower (2006) reveal that (i) implementation of environmental and social protection measures needs to be considered as well as their design, (ii) technical and project management capacity and budget of the implementing agency and ADB safeguards usability can challenge sustainability and impact of the project, and (iii) an environmental and socioeconomic baseline in the wider project area is essential to determine project impacts and therefore mitigation.

23. The evaluation criteria to be addressed will cover the following issues:

(i) **Relevance.** How appropriate was ADB's assistance to Nepal's development needs in general and sector needs in particular? Were the needs of Nepal power sector adequately assessed and in particular were alternatives to the Kali Gandaki "A" project examined and discussed with stakeholders? Was the least cost intervention demonstrated and adopted at pre feasibility stage? Did ADB provide the appropriate intervention? Was there sufficient community participation at project design, during project implementation and post project completion, i.e., during operation? Was the ADB product extended to Nepal's power sector well-balanced (institutional strengthening, provision of physical infrastructure, policy advice, regulation)? Was ADB's assistance to

[10] *The environmental impact audit was undertaken as required by the loan agreement schedule 6 signed between ADB and HMG/N.*

[11] ADB. 2006. *Guidelines for Preparing Performance Evaluation Reports for Public Sector Operations.* Manila.

Nepal's power sectors consistent with ADB's development goals? Could the project design at appraisal have taken into account the rerouting and extension of the transmission line to Pokhara? Could the geological survey at appraisal have recognized the change in slope behind the de-sander basin so that a change in scope could have been avoided?

(ii) **Effectiveness**. Did ADB's assistance to the Nepal's power sectors achieve what they intended? Was/were the objective(s) clear and in line with ADB mandate? Was/were the objective(s) for the government and ADB similar? Was the objective clearly poverty alleviation? Did scope changes improve effectiveness? Did the safeguards implementation succeed?

(iii) **Efficiency**. Did ADB's assistance to the power sector use the resources economically? Did ADB's assistance achieve economic benefits at least cost? Did the economic benefits accrue to project impacted people similarly to other citizens in Nepal, i.e., investigate the distribution of benefits? Determine the operational performance of the Project's facilities focusing on their physical condition and operational efficiencies.

(iv) **Sustainability**. Assess the financial and physical sustainability of the assets created and/or rehabilitated and determine the adequacy of operations and maintenance to make the Project sustainable. How sustainable are the outcomes of ADB's projects, TA, and policy dialogues? Have changes in the political, business, environments adversely affect a sustained outcome even though outputs are maintained? Is the intervention environmentally and socially sustainable? Were there catchment management initiatives? Institutional strengthening of pertinent agencies, were tariffs for services in line with project forecasts and sustainable? Has sufficient operation and maintenance (O&M) been allocated to the project since commercial operation date?

(v) **Impacts**. Review available benefit and monitoring reports to assess the impact of the project facilities. What are the impacts of ADB's assistance to institutions and how significant and sustainable are they? Did ADB assistance improve or weaken the ability of Nepal to make more efficient, equitable and sustainable use of its human, financial and natural resources? Who benefited from ADB's assistance? How were the economic benefits distributed? Were there any adverse social impacts? If so were they taken into account at the time alternatives were being investigated? did ADB initiate measures to mitigate these adverse impacts once the project got underway? Are there any outstanding resettlement or other issues with project affected families? Do project affected families have access to jobs generated by the Project? Were all environmental impacts that occurred during construction and operation, taken into account during the environmental and social impact assessment (ESIA) stage? Were remedial measures taken to minimize adverse impact on the environment e.g. aquatic ecology? If so, were the remedial measures effective in neutralizing the Project's adverse impact on the aquatic ecology? Were all other environment issues identified at appraisal addressed satisfactorily? If not, has the EA taken measures to mitigate these outstanding environment issues? Did the project have the intended impact on poverty reduction?

(vi) **Operational and financial performance of the executing agency.** The IEM will assess the operational and financial performance of NEA looking into compliance with financial covenants and financial capacity to provide adequate maintenance to project facilities. This will involve a review of tariffs since operation, customer base, revenue and outgoings for staff and O&M of the facility.

I. IEM Composition and PPER Approach and Schedule

24. The main activities of the IEM will include: (i) meeting with the officials of the project implementation organizations to obtain their assessment of the loan formulation and to obtain key data on the operational and financial performance of the executing agency and the Project; (ii) performing an assessment of the engineering design to determine that the Project was a least-cost optimal design for the circumstances at the time and that the project design was integrated with environmental and social features in order to minimize impacts on environmental and social capital; (iii) site inspection on the quality of construction and level of maintenance, (iv) meeting with appropriate authorities in Kathmandu to determine the long-term development plan for the power sector in Nepal including tariff setting, (v) meetings with nongovernment organizations (NGOs) both national and international to discuss Kali Gandaki "A."

25. The evaluation will include the following key activities:

(i) Desk review of relevant and available documents in ADB;
(ii) Consultation with staff from SAEN and NRM;
(iii) Consultations with staff of relevant government offices;
(iv) Field visits to the project site to hold discussions with local officials, nongovernment organizations, and a sample of the project beneficiaries;
(vi) Drafting and finalizing the PPER according to standard IED procedures.

26. The IEM will consist of an evaluation specialist (team leader), international consultant [engineering] and national consultants for institutional and finance aspects. The team leader will have overall responsibility for the PPER preparation; derive lessons from implementation issues; the hydro-engineering specialist will cover the review of the operations of project facilities; and the financial specialist will cover re-estimation of EIRR and FIRR including review of tariffs, risk analysis, poverty integration; review the benefit monitoring and evaluation system and provide guidance in the conduct the environmental and social assessment.

27. The following approximate schedule is proposed for the mission and preparation of the PPER. The schedule is acknowledged to be very tight for completion by end December 2011 and assumes availability of and timely contracting of consultants, concurrence for the mission from the government received in time for the fielding of the IEM, timely review and drafting process.

Activity	Approximate Schedule
Evaluation Approach Paper Approval	III September 2011
Recruitment of International Consultant	II October 2011
Independent Evaluation Mission	I November 2011
IED Internal Review	IV November 2011
Interdepartmental Circulation	I December 2011
Draft to Editor	III Dec 2011
Submission to the Director IED1	IV Dec 2011

EVALUATION DESIGN MATRIX

Criteria	Question	Subquestion	Type of Subquestion	Measure or Indicator	Target/ Standard	Baseline Data?	Data Source	Design	Sample or Census	Data Collection Instrument	Data Analysis	Team Member Responsibilities			
												TL	FS/ Ec	HS/ ES	SS
Relevance	Were the needs assessment of the Kali Gandaki "A" correct?	Was the Project aligned with Government priorities?	Normative	Project purpose matches GoN purpose	Government priorities at the time (1991)	Government priorities at the time (1991)	ADB archives, CSP, ESW	Descriptive	Census	Project files	Qualitative	**X**			
Relevance		Was the Project aligned with Asian Development Bank (ADB) priorities in the country?	Normative	Project purpose matches ADB purpose	ADB country priorities at the time (1991)	ADB country priorities at the time (1991)	ADB archives, CSP, ESW	Descriptive	Census	Project files	Qualitative	**X**			
Relevance		Was the Project aligned with ADB priorities in the sector?	Normative	Project purpose matches ADB purpose for that sector	ADB sector priorities at the time (1991)	ADB sector priorities at the time (1991)	ADB archives, GoN, NEA Meetings	Descriptive	Census	Project files	Qualitative	**X**			
Relevance		Was the Project formulated based on a thorough diagnostic analysis, building on existing knowledge and expertise?	Descriptive	Review project rationale parameters, quantitative?, analysis?, conclusion?		Energy sector statistics (1991); Poverty analysis (S/E data) 1991	ADB d/base (economic research), project files, SE poverty data in project area LSMS data (WB?)	Descriptive	Census	Project files	Qualitative	X	**X**	X	X
Relevance		Were the views of principal stakeholders reflected in the Project designs?	Normative	Project design matches consultation records	Standards set by views of stakeholders		project files records of consult-ation, project designs	Descriptive	Census	Project files	Qualitative	X		**X**	**X**
Relevance		did the design undergo changes as a result of such consultations?	Cause & Effect	Look for project design iterations in specific parameters like reservoir size, DS releases, location of mina components, TL, road, from records of consultations			project files records of consult-ation, project designs	Descriptive	Census	Project files	Qualitative	X		**X**	**X**

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Relevance		Were lessons learned from previous hydropower Projects in Nepal and other countries considered in Project formulation?	Descriptive	Look for relevant section in RRP on technical, finance and organization of NEA, E&S. Look for implementation reports and compare to lessons learned.		Summary of lessons learned in 1991	Project files, RRP	Descriptive	Census	Project files	Qualitative	X		**X**	**X**
Relevance		Were alternatives to KG-A considered?	Descriptive	Look for project files discussing this e.g. economic analysis talks about thermal options, but small hydro?			Project files, RRP	Descriptive	Census	Project files	Qualitative	X	**X**	X	
Efficiency	Were the resources and services provided adequate to the require-ments of the Project	Were the different levels of Project funding appropriate for achieving Project objectives? (what was the objective of the project)	Descriptive	Look in project files, discussion of budget adequacy			Project files, RRP	Descriptive	Census	Project files	Qualitative		**X**	X	
Efficiency		Did the Project's design provide the most suitable mix of international and domestic consultants for achieving Project objectives?	Descriptive				Project files, RRP	Descriptive	Census	Project files	Qualitative	X		**X**	X
Efficiency		What was the quality of the terms of reference?	Descriptive	level of detail, look at Finance, engineering, E&S, insitutional			Project files, RRP	Descriptive	Census	Project files	Qualitative	X	X	**X**	X
Efficiency		Was the design complementary to support from other donors?	Descriptive	evidence of joint support			Project files, RRP	Descriptive	Census	Project files	Qualitative	**X**			

Criteria	Question	Subquestion	Type of Subquestion	Measure or Indicator	Target/ Standard	Baseline Data?	Data Source	Design	Sample or Census	Data Collection Instrument	Data Analysis	Team Member Responsibilities			
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Effective-ness	Were the outcomes of the Project, as defined in the appraisal reports/ report and recommend ation of the President (RRP), achieved or are expected to be achieved	Did the Project outputs as achieved lead (or will lead) to the attainment of Project outcomes ? i.e. did recipient HHs benefit from improved electricity supply?	Cause & Effect	HHs improved electricity supply		Prior to project electricity supply data	Electricity supply statistics from project files, economic research dep., Nepal RM, LSMS	Quasi-experiment al	Sample	Review of surveys	Quantita-tive	X	**X**	X	**X**
Impacts		Did the project result in poverty alleviation?, improved standard of living? i.e. did recipient HHs benefit from improved living standard?	Cause & Effect	HHs improved living standard (incomes)		Income data for HHs in project area pre project	income statistics from project files, economic research dep., Nepal RM, LSMS	Quasi-experiment al	Sample	Review of surveys	Quantita-tive	X	**X**	X	**X**
Impacts		Were any PAPs impoverished as a result of the project? during construction and/or operation?	Cause & Effect	HH decline in living standard/ income		Income data for HHs in project area pre project	income statistics from project files, economic research dep., Nepal RM, LSMS	Quasi-experiment al	Sample	Review of surveys	Quantita-tive	X	X		**X**
Impacts		Did poor HHs receive electricity from the project?	Cause & Effect	HHs improved electricity supply		lowest income quartile and data on electricity supply, ability to pay data	income statistics from project files, economic research dep., Nepal RM, LSMS	Quasi-experiment al	Sample	Review of surveys	Quantita-tive	X	**X**	X	**X**

Criteria	Question	Subquestion	Type of Subquestion	Measure or Indicator	Target/ Standard	Baseline Data?	Data Source	Design	Sample or Census	Data Collection Instrument	Data Analysis	Team Member Responsibilities			
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Efficiency		Did the implementation arrangements work well?	Descriptive	Look at project files showing delays in construction/ COD		Planned completion dates	Project files	Descriptive	Census	Project files	Qualitative	X		**X**	
Efficiency		Were there any delays as a result of E&S matters?	Descriptive	a/a		Planned completion dates	Project files	Descriptive	Census	Project files	Qualitative	X		X	**X**
Relevance		Was there sufficient coordination with NGOs, community groups and other donors to ensure their interests were respected?	Descriptive	look for letters of complaints to ADB / grievance process			Project files, NGO websites	Descriptive	Census	Project files	Qualitative	X			**X**
Efficiency	Were the Project's outputs achieved efficiently and will they likely be sustained?	How closely were the Project's designs followed, and what changes were made?	Normative	design iterations, number of issued notices from contractor to owner	Standards will be project designs, technical drawings	Initial approved designs at FC	Project files	Descriptive	Census	Project files	Qualitative			**X**	
Efficiency		Did ADB consultant / contractors recruitment procedures lead to timely recruitment of suitable, qualified, and experienced experts?	Descriptive	procurement files, delays, number of days delay		Planned mobilisation	Project files	Descriptive	Census	Project files	Qualitative	X		**X**	
Efficiency		How did the consultants and contractors perform?	Descriptive	number of days delay, cost overrun, notices requiring corrective actions from owner			Project files	Descriptive	Census	Project files	Qualitative			**X**	
Sustain-ability		Were electricity tariffs sufficient to provide revenue for NEA? And were the revenues used for O&M ? Is this likely to be sustained?	Descriptive	financial analysis			Electricity supply statistics from project files, economic research dep., Nepal RM,	Descriptive	Census	Project files	Qualitative		**X**		

Criteria	Question	Subquestion	Type of Subquestion	Measure or Indicator	Target/ Standard	Baseline Data?	Data Source	Design	Sample or Census	Data Collection Instrument	Data Analysis	Team Member Responsibilities			
												TL	FS/ Ec	HS/ ES	SS
							LSMS, GoN (NEA) data, NEA revenue data								
Efficiency		Were there any feedback loops to ensure early reporting of implementation problems?	Descriptive	evidence of adaptive management, real time monitoring , institutional arrangements, date problems occur and date reported			Project files	Descriptive	Census	Project files	Qualitative	**X**		X	
Efficiency		Was ADB sufficiently on site to be aware and assist in resolving problems?	Descriptive	number of missions and when in relation to above, staff of ADB qualifications, position, seniority			Project files	Descriptive	Census	Project files	Qualitative	**X**			
Efficiency		Did ADB identify problems ahead of time to prevent them occurring?	Descriptive	a/a but unlikely			Project files	Descriptive	Census	Project files	Qualitative	**X**			
Efficiency		Did ADB monitor the project strictly in terms of its own policy? Or did they look at outputs and outcomes?	Descriptive	BTORs sections will provide overview of this….		ADB energy policy (1991), poverty reduction madate (1991). if it existed	Project files, BTORs	Descriptive	Census	Project files	Qualitative	**X**			
Efficiency		Was ADB supervision sufficient to support Project implementation?	Descriptive	number of missions and when in relation to above, staff of ADB qualifications, position, seniority			Project files, BTORs	Descriptive	Census	Project files	Qualitative	**X**			

Criteria	Question	Subquestion	Type of Subquestion	Measure or Indicator	Target/ Standard	Baseline Data?	Data Source	Design	Sample or Census	Data Collection Instrument	Data Analysis	Team Member Responsibilities			
												TL	FS/ Ec	HS/ ES	SS
Sustain-ability		Are the Project facilities and benefits likely to be sustained?	Descriptive	financial analysis			Electricity supply statistics from project files, economic research dep., Nepal RM, LSMS, GoN (NEA) data, NEA revenue data	Descriptive	Census	Project files	Qualitative		**X**	X	X
Sustain-ability	Was there adequate ownership and commit-ment on the part of the Govt and the executing agency to implement the recommend ations?	Did the Government (central and local) provide adequate support to the Project during implementation?	Descriptive	meeting notes to that effect / financing arrangement local contribution			Project files	Descriptive	Census	Project files	Qualitative			**X**	X
Sustain-ability		Was there adequate participation from Government representatives /EAs/NGO/stakeholder s during the implementation of the Projects?	Descriptive	BTORs sections, letters from GoN to Owner…			Project files	Descriptive	Census	Project files	Qualitative	X		**X**	X
Sustain-ability		Was there sufficient consultation/collaborati on with the Government/EAs/ stakeholders in determining recommended actions?	Descriptive	BTORs sections, letters from GoN to Owner…			Project files	Descriptive	Census	Project files	Qualitative	X		**X**	X

Criteria	Question	Subquestion	Type of Subquestion	Measure or Indicator	Target/ Standard	Baseline Data?	Data Source	Design	Sample or Census	Data Collection Instrument	Data Analysis	Team Member Responsibilities			
												TL	FS/ Ec	HS/ ES	SS
Impact	Was there an adequate assessment of environ-mental and social impact? Were the environ-mental and social protection measures implemented and achieve their objectives?	Did the consultations with stakeholders/ persons affected by the Project/ EAs/NGO result in changed project selection and designs?	Cause & Effect	Look for project design iterations in specific parameters like reservoir size, DS releases, location of mina components, TL, road, from records of consultations		initial designs, consultation records, final designs	Project files	Descriptive	Census	Project files	Qualitative	X		**X**	**X**
Impact		Were E&S surveys undertaken to quantify PAPs situation and ecosystem situation? Ie were there baseline data?	Descriptive	ESIA files look for S/E and Env data in project area		SE information and key environment al indicators (water, land use, coverage, existing infrastructure	income statistics from project files, economic research dep., Nepal RM, LSMS	Descriptive	Census	Project files	Qualitative	X			**X**
Impact		Did the poor benefit from the Project?	Cause & Effect	HHs improved electricity supply		Pre project electricity supply to lowest quartile income HHs	Electricity supply statistics from project files, economic research dep., Nepal RM, LSMS	Quasi-experiment al	sample	Review of surveys	Quantita-tive		**X**		**X**
Impact		What kind of benefit did they derive from the Project?	Cause & Effect	HHs improved electricity supply		Pre project electricity supply to lowest quartile income HHs	Electricity supply statistics from project files, economic	Quasi-experiment al	sample	Review of surveys	Quantita-tive		**X**		**X**

Criteria	Question	Subquestion	Type of Subquestion	Measure or Indicator	Target/ Standard	Baseline Data?	Data Source	Design	Sample or Census	Data Collection Instrument	Data Analysis	Team Member Responsibilities			
												TL	FS/ Ec	HS/ ES	SS
Impact		Are the poor continuing to benefit from the operation of the project? How many poor households benefited?	Cause & Effect	HHs improved electricity supply, # HHs,		Pre project electricity supply to lowest quartile income HHs	research dep., Nepal RM, LSMS Electricity supply statistics from project files, economic research dep., Nepal RM, LSMS income statistics	Quasi-experimental	sample	Review of surveys	Quantitative		X		X
Impact		How did the Project affect the economic and social welfare families in and around the Project area?	Cause & Effect	Y, Living standard		Pre project HH incomes in project area	from project files, economic research dep., Nepal RM, LSMS	Quasi-experimental	sample	Review of surveys	Quantitative		X		X
Impact		Have all project land affected families from the construction of project facilities been adequately compensated?	Descriptive	Grievance records			Project files, NEA	Descriptive	Census	Project files	Qualitative				X
Impact		What were the environmental impacts in the project area during construction and during operation?	Descriptive	Project designs, ESIA parameters such as fisheries, erosion, turbidity, BOD		pre project environmental conditions, post project environmental conditions	BTORs	Descriptive	Census	Project files	Qualitative				X
Impact		Was the project area defined to include downstream impacts?		Project design, EIA			Project files	Descriptive	Census	Project files	Qualitative				X
Impact		Were all mitigation measures incorporated in the project design?	Descriptive	project design iterations, costs,			Project files	Descriptive	Census	Project files	Qualitative			X	X
Impact		How was the performance of the contractor and subbies in implementing EPMs?	Descriptive	Look at project files showing delays in construction/ COD			Project files	Descriptive	Census	Project files	Qualitative			X	X

Criteria	Question	Subquestion	Type of Subquestion	Measure or Indicator	Target/ Standard	Baseline Data?	Data Source	Design	Sample or Census	Data Collection Instrument	Data Analysis	Team Member Responsibilities			
												TL	FS/ Ec	HS/ ES	SS
Impact		Were there adequate livelihood restoration initiatives during construction and beyond COD?	Descriptive	Mix of social programmes, budget, staff, scope, area, participating HHs			ESIA, SDP, IPP, income statistics from LSMS data	Descriptive	Census	Project files	Qualitative				**X**
Efficiency	Procure-ment issues	Was the procurement process observed?	Descriptive	Project files misprocuremen t note			project files	Descriptive	Census	Project files	Qualitative			**X**	
Efficiency		Was there a criteria related to contractor knowledge and performance on E&S matters	Descriptive	selection parameters			project files	Descriptive	Census	Project files	Qualitative			X	**X**
Efficiency	Risk of Corruption	Were potential risks of corruption identified on time and how were they addressed?	Descriptive	reporting of malpractices			project files	Descriptive	Census	Project files	Qualitative			**X**	